U.S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: INFORMATION: Guidance for Flammability Testing of Seat/Console Installations

Date: October 17, 1997

From: Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100

Reply to Attn. of: 97-112-39

To: SEE DISTRIBUTION

This memorandum provides guidance for flammability testing of seat installations, where the seat includes an integral stowage compartment and other console assemblies, or is otherwise constructed with large panels. These seats are typically first class seats, installed at very large pitch and permit full flat recline (see attachment.)

The flammability regulations are written very explicitly with respect to seat cushions, but do not explicitly address other parts of seats. The Technical Standard Orders for seats (C39 and C127) require that seat components, other than cushions, be tested only to the bunsen burner requirements in appendix F, part I, of part 25. This has been generally accepted as sufficient to demonstrate compliance with part 25 as well.

By the same token, regulations for interior panels (including ceilings, sidewalls, galleys and stowage compartments) are also very explicit and, for airplanes with 20 or more passenger seats, require compliance with appendix F, parts IV and V, of part 25 (heat release and smoke emission, respectively). When the regulations for heat release were written there was an explicit exclusion in the preamble for components such as the tray table found on the backs of seats since they were of a size that was not considered significant and, by virtue of the separation between seats, would not spread a fire throughout the cabin. Full scale fire tests at the FAA Technical Center confirmed that tray tables meeting the heat release requirements did not materially improve survivability in the cabin.

In the case of the seats discussed above however, the assumptions used to arrive at these conclusions are no longer valid. As shown in the attachment, the seat structure is directly connected to, and contiguous with, large interior panels that are clearly required to comply with heat release and smoke emissions requirements. In addition, these seats typically have a hard shell covering the entire back of the seat, rather than a small food tray mounted to the seatback. From the standpoint of surface area, each seat/console assembly constitutes a significant amount of material, on the order of a galley or closet. Since part of the surface is obviously required to comply with heat release and smoke emissions requirements, and since the surface is contiguous, all large panels should meet these requirements. This is consistent with other applications of the rule, where all components that make up an affected part (for example, several small panels that make up a large ceiling panel) are required to comply with the standard applicable to the larger part. Therefore, the outer shell of the seat itself is required to

comply with appendix F, parts IV and IV, of part 25. In this case, some of the components happen to be attached to a seat, but the usage dictates compliance with the higher standard.

There may also be seat assemblies where no additional stowage compartments or consoles are attached to the seat, but where the outer shell structure of the seat essentially forms a partition. The shell may partition one seat place from another, one row of seats from another, or both. These structures should also be tested to the requirements of appendix F, parts IV and V, even though they may be part of a seat.

Part 25 has provisions for flammability testing of components based on both usage and type of material. This is a carryover from a time when materials were very limited and the only available materials simply did not have state of the art flammability characteristics. Generally speaking, the requirements based on material type are the least severe in the regulation. Nonetheless, when usage is specified, and no specific exclusion is made, the usage requirement dictates the type of flammability test, irrespective of the material used. For example, a ceiling panel constructed of elastomeric materials is required to comply with heat release and smoke emission requirements by virtue of its usage, even though elastomeric materials are referred to elsewhere and require a lesser standard.

Since the TSO holders may not be aware of the particular installation requirements, please be sure that this information is also communicated to them.

Any questions may directed to Jeff Gardlin at (425)227-2136, Frank Tiangsing at (425)227-2121 or Terry Rees at (425)227-2138.

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Attachment